Challenging conventional wisdom

The increasingly mainstream use of active RFID for healthcare, pharmaceuticals, defense and other mission critical applications seems to have given the lie to the many expert predictions that the technology would be limited solely to niche areas

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The world of RFID is changing very rapidly indeed. Conventional wisdom about RFID applications, technologies and adoption is constantly evolving. In certain respects the world of RFID, like that of many other fast emerging technologies, is tough to define or predict with any degree of accuracy. Often, projections based on market analysis, logical deduction and interviews are proven wrong as innovative solutions are developed by pioneering companies and adopted by users who were looking for a solution to their problems but did not get trapped by conventional wisdom.

Applications for active tags or battery powered RFID transponders have grown significantly over the last few years. Many in the identification industry believed that the role of active RFID transponders would be limited to a few percent of the overall market. Various massive scale initiatives, such as item level tagging for Wal-Mart, Metro and US DOD, further helped convince much of the industry that passive tags would be utilized in the billions while active tags would be limited to small, niche applications.

The recent rapid development of RFID transponders integrated with environmental sensors, such as temperature or humidity, offers exciting solutions for many problems ranging across numerous industries. Where RFID was once merely a more reliable

and convenient replacement for traditional automatic identification devices, such as barcodes, these new applications have transformed RFID into an integral part of a system or process. We are therefore now seeing active RFID used to monitor and identify the temperature of pharmaceutical products in cold chain applications or to monitor and identify the change in condition of munitions as a result of vibration, temperature or humidity.

Integration of identification into process and systems

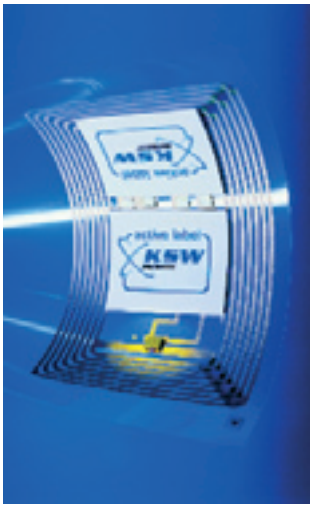
The basic logic of integration goes something like this: having taken the additional step of identifying an item, such as a bottle of medicine or a bag of donor blood, or a group of items in a box or on a pallet, could the identification device now be used to tell us more about the condition of that item? The process improvements that result from this individualized condition monitoring can translate into cost savings and make the case for adoption of RFID significantly more compelling. Indeed, this realization has helped fuel the phenomenal recent growth in the adoption of active RFID.

The payback equation has meant that innovation in active RFID has been taking place at both ends of the chain. Not only are we seeing a reduction in cost of individual transponders, with some very interesting additional innovations in low power active and semi-active transponders, we are also seeing a further expansion of capabilities where transponders act as nodes on a network, with the focus on increased functionality, reliability, read distance and tolerance in difficult environments. These improved capabilities are recognition that the critical task of condition monitoring is driving the payback equation. We are therefore seeing a move towards technologies not immediately thought of as RFID but rather WAN / LAN such as in the use of ZigBee protocols.

In the pharmaceutical industry, the logic can be very compelling. The introduction of active RFID for identification and condition monitoring offers some important benefits, including cost savings in packaging and transportation as well as quality assurance and thus also the limiting of liability. In the food industry, the retailer is able to quickly and accurately check the quality of a shipment on arrival and verify whether a box of fruit or frozen fish has experienced a troubled shipment with exposure to excessively high temperature. The retailer can save considerable costs by simply rejecting the shipment, thus avoiding problems with quality or returns. Similarly, the transporter can confirm the conditions of the items prior to taking possession of them and can prevent problems with early en-route alerts and thus also avoid penalties.

A new class of integrators

The cost and the payback equation will likely play an important part in the adoption of condition monitoring RFID, as will the reliability and ease of service. These factors will continue to stimulate interesting innovations in this area of RFID. We will also witness the development of a new class of integrators with deep domain expertise. Thus far, most of the integration in industrial applications has been dependent on an understanding of auto ID and ID solutions. Clearly, as the ID becomes far more integrated in the process, the integrator's knowledge of the process will play an important part in the successful completion of projects, in achieving payback, and in developing additional applications. This added process knowledge will further reduce costs and develop process improvements in a positive feedback cycle.



An active RFID tag

Active RFID can play a key role in monitoring the conditions and temperature of pharmaceuticals and food, for example, during shipping